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Randy Lipsitz
Kramer Levin Naftalis & Frankel LLP
919 Third Avenue
New York, NY 10022

EXAMINER	
WALLING, MEAGAN S	
ART UNIT	PAPER NUMBER
2863	

DATE MAILED: 05/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/084,541	SCHMIDT ET AL.	
	Examiner	Art Unit	
	Meagan S Walling	2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 February 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19,27-29 and 31-38* is/are rejected.

7)☒ Claim(s) *20-26 and 30* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1, 2, 13, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Boesch et al. (US 5,721,528).

Regarding claim 1, Boesch et al. teaches sensing at least one attribute associated with wheel rotation of each of at least four wheels (column 2, lines 35-36), and determining travel distances covered by each of at least four wheels by evaluating at least one attribute for each of at least four wheels (column 2, lines 35-36).

Regarding claim 2, Boesch et al. teaches that the attribute associated with rotation of at least four wheels is rotational speed (column 3, line 67 – column 4, line 1).

Regarding claim 13, Boesch et al. teaches a tire pressure monitoring system for a vehicle havng a plurality of wheels, a plurality of axles for supporting the wheels, and an anti-lock braking system including a control unit, the monitoring system comprising wheel sensors on a least one of the wheels of at least one of the axles for sensing attributes associated with wheel rotation (column 2, lines 35-36), the control unit adapted to logically combine the attributes and to evaluate the attributes with respect to change of rolling radii of the wheels and to account for change of the attributes caused by driving operation (column 2, lines 24-27, 32-34), and means

for generating a warning signal when the change of the attributes caused by tire pressure decrease exceeds a preselected limit value (column 2, lines 27-28).

Regarding claim 15, Boesch et al. teaches that the attributes associated with wheel rotation are at least one of the travel distances covered by the wheels and the rotational speeds of the wheels (column 2, lines 34-35).

2. Claims 33, 34, 35, and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Okawa et al. (US 5,591,906).

Regarding claim 33, Okawa et al. teaches sensing a value associated with wheel rotation for each of the wheels (column 4, lines 10-12), summing the value along diagonal groupings of the wheels relative to the arrangement of the wheels on the vehicle (column 4, lines 17-20), comparing the sums of the values for each diagonal grouping of the wheels (column 4, lines 20-22), recognizing an insufficient tire pressure condition (column 4, lines 22-26), and generating a warning signal when the sums differ from one another by more than a preselected limit value (column 19, lines 19-22).

Regarding claim 34, Okawa et al. teaches ascertaining whether the sums for each diagonal grouping of the at least four wheels have one of a positive and negative and zero values, and determining the location of a wheel exhibiting an insufficient tire pressure based on whether he sums are one of positive and negative and zero (column 11, lines 50-59). Okawa's definition of dF = 1 is equivalent to the difference equaling zero.

Regarding claim 35, Okawa et al. teaches that the step of sensing the value associated with wheel rotation is carried out in a plurality of monitoring cycles (column 4, lines 36-67 describe a plurality of cycles), and further comprising the step of recognizing an insufficient tire

pressure condition when deviations of the sums of the travel distances for diagonal groupings of the at least four wheels exceed a preselected limit value for the monitoring cycles (column 4, lines 23-26).

Regarding claim 38, Okawa et al. teaches that the value associated with wheel rotation is rotational speed (column 4, lines 10-12).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 3-12, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boesch et al. in view of Okawa et al. (US 5,591,906).

Boesch et al. teaches all of the limitations of claims 3-12, and 32 except the limitation that the travel distances covered by each of at least four wheels are summed along diagonal groupings relative to the arrangement of the at least four wheels on the vehicle (current claim 3), the step of comparing the sums of travel distances for each diagonal grouping of the at least four wheels and recognizing an insufficient tire pressure when the sums differ from one another by more than a preselected limit value (current claim 4), that the step of determining the travel distances covered by each of at least four wheels is carried out in a plurality of monitoring cycles and further comprising the step of recognizing an insufficient tire pressure condition when deviations of the sums of the travel distances for diagonal groupings of the at least four wheels

exceed a preselected limit value for the monitoring cycles (current claim 5), that the attributes that depend on wheel rotation are pulsed signals and the signals are counted in the step of determining the travel distances covered by each of the at least four wheels (current claim 6), half waves of the pulsed signals are counted in the step of determining the travel distances covered by each of at least four wheels (current claim 7), ascertaining whether the sums for each diagonal grouping of the at least four wheels have one of a positive and negative and zero values, and determining the location of a wheel exhibiting an insufficient tire pressure based on whether he sums are one of positive and negative and zero (current claims 8 and 12), summing rotational speed of each of the at least four wheels along diagonal groupings of the at least four wheels relative to the arrangement of the at least four wheels on the vehicle (current claim 9), the step of comparing the sums of the rotational speeds for each diagonal grouping of the at least four wheels and recognizing an insufficient tire pressure condition when the sums differ from one another by more than a preselected limit value (current claim 10), that the step of determining the rotational speed of each of at least four wheels is carried out in a plurality of monitoring cycles, and further comprising the step of recognizing an insufficient tire pressure condition when deviations of the sums of the travel distances for diagonal groupings of the at least four wheels exceed a preselected limit value for the monitoring cycles (current claim 11), and counting periods of signals to determine thet travel distances covered by the wheels (current claim 32)..

Regarding claim 3, Okawa et al. teaches comparing the rotational angular velocities of a pair of tires on a diagonal line to the rotational angular velocities of another pair of tires on a diagonal line (column 4, lines 17-20).

Regarding claim 4, Okawa et al. teaches the step of comparing the sums of travel distances for each diagonal grouping of the at least four wheels and recognizing an insufficient tire pressure when the sums differ from one another by more than a preselected limit value (column 4, lines 23-26).

Regarding claim 5, Okawa et al. teaches that the step of determining the travel distances covered by each of at least four wheels is carried out in a plurality of monitoring cycles (column 4, lines 36-67 describe a plurality of cycles), and further comprising the step of recognizing an insufficient tire pressure condition when deviations of the sums of the travel distances for diagonal groupings of the at least four wheels exceed a preselected limit value for the monitoring cycles (column 4, lines 23-26).

Regarding claim 6, Okawa et al. teaches that the attributes that depend on wheel rotation are pulsed signals and the signals are counted in the step of determining the travel distances covered by each of the at least four wheels (column 4, lines 52-56).

Regarding claim 7, Okawa et al. teaches that half waves of the pulsed signals are counted in the step of determining the travel distances covered by each of the at least four wheels (column 5, lines 2-9).

Regarding claims 8 and 12, Okawa et al. teaches ascertaining whether the sums for each diagonal grouping of the at least four wheels have one of a positive and negative and zero values, and determining the location of a wheel exhibiting an insufficient tire pressure based on whether he sums are one of positive and negative and zero (column 11, lines 50-59). Okawa's definition of dF = 1 is equivalent to the difference equaling zero.

Regarding claim 9, Okawa et al. teaches summing rotational speed of each of the at least four wheels along diagonal groupings of the at least four wheels relative to the arrangement of the at least four wheels on the vehicle (column 4, lines 17-20).

Regarding claim 10, Okawa et al. teaches the step of comparing the sums of the rotational speeds for each diagonal grouping of the at least four wheels and recognizing an insufficient tire pressure condition when the sums differ from one another by more than a preselected limit value (column 4, lines 23-26).

Regarding claim 11, Okawa et al. teaches that the step of determining the rotational speed of each of at least four wheels is carried out in a plurality of monitoring cycles (column 4, lines 36-67 describe a plurality of cycles), and further comprising the step of recognizing an insufficient tire pressure condition when deviations of the sums of the travel distances for diagonal groupings of the at least four wheels exceed a preselected limit value for the monitoring cycles (column 4, lines 23-26).

Regarding claim 32, Okawa et al. teaches counting periods of signals to determine the rotational angular velocity (column 4, lines 52-56).

It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Boesch et al. with the teachings of Okawa et al. to diagonally sum distances traveled. It would be obvious to measure the diagonals because the influencing of cornering is cancelled by measuring the inner and outer wheels together.

4. Claims 14, 16-19, 27-29 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boesch et al. in view of Achterholt (US 6,476,712).

Boesch et al. teaches all of the limitations of claims 14, 16-19, 27-29, and 31 except the limitation that the monitoring system comprises a tire pressure measuring system for measuring the tire inflation pressure of at least one of the wheels of at least one of the axles (current claim 14) and the tire pressure measuring system includes at least one wheel electronics package having a pressure sensor and an HF transmitter for transmitting the measured tire inflation pressure, a receiver/evaluation device for receiving the measured tire inflation pressure and comparing the tire inflation pressure with the preselected setpoint pressure (current claim 16), at least one wheel electronics package is disposed on at least one of the wheels (current claim 17), at least one wheel electronics package is disposed on the vehicle (current claim 18), wheel sensors and at least one wheel electronics package are provided for each of the wheels of all of the axles (current claim 19), that the receiver/evaluation device is integrated into the control unit (current claim 27), a controller area network interface for controlling the transmission and reception of signals representing the measured tire inflation pressure (current claim 28), a microcontroller for receiving signals representing the measured tire inflation pressure from at least one wheel electronics package (current claim 29), and an identifier that is transmitted during transmission of the measured tire inflation pressure (current claim 31).

Regarding claim 14, Acherholt teaches a tire pressure measuring system for measuring the tire inflation pressure of at least one of he wheels of at least one of the axles (column 3, lines 66-67).

Regarding claim 16, Achterholt teaches at least one wheel electronics package having a pressure sensor (column 3, lines 66-67) and an HF transmitter for transmitting the measured tire inflation pressure (column 4, line 1), a receiver/evaluation device for receiving the measured tire

inflation pressure (column 4, lines 3-5) and comparing the tire inflation pressure with the preselected setpoint pressure (column 2, lines 23-24; column 3, lines 58-59).

Regarding claim 17, Achterholt teaches that at least one wheel electronics package is disposed on at least one of the wheels (column 3, line 65).

Regarding claim 18, Achterholt teaches that at least one wheel electronics package is disposed on the vehicle (column 3, line 65).

Regarding claim 19, Achterholt teaches that wheel sensors and at least one wheel electronics package are provided for each of the wheels of all of the axles (column 3, line 65).

Regarding claim 27, Achterholt teaches that the receiver/evaluation device is integrated into the control unit (column 4, lines 4-5).

Regarding claim 28, Achterholt teaches a controller area network interface for controlling the transmission and reception of signals representing the measured tire inflation pressure (column 4, lines 6-8).

Regarding claim 29, Achterholt teaches a microcontroller for receiving signals representing the measured tire inflation pressure from at least one wheel electronics package (column 4, lines 4-6).

Regarding claim 31, Achterholt teaches an identifier that is transmitted during transmission of the measured tire inflation pressure (column 4, lines 9-10).

It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Boesch et al. with the teachings of Acheterholt. Achterholt merely measures tire pressure directly instead of calculating it from other parameters, as taught by Boesch et al.

5. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okawa et al. in view of Achterholt.

Okawa et al. teaches all the limitations of claim 36 except the steps of measuring the tire inflation pressure of at least one of said wheels of at least one of said axles utilizing a tire pressure measuring apparatus, and comparing said tire inflation pressure with a preselected setpoint pressure.

Achterholt teaches the steps of measuring the tire inflation pressure of at least one of said wheels of at least one of said axles utilizing a tire pressure measuring apparatus (column 3, lines 65-67), and comparing said tire inflation pressure with a preselected setpoint pressure (column 2, lines 23-24; column 3, lines 58-59).

It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Okawa et al. with the teachings of Achterholt. By directly taking a measurement of tire pressure instead of calculating it, time is saved and measurements are more accurate.

6. Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okawa et al. in view of Boesch et al.

Okawa et al. teaches all the limitations of claim 37 except that the value associated with wheel rotation is wheel travel distance.

Boesch et al. teaches measuring travel distance (column 2, lines 34-35).

It would have been obvious to one skilled in the art at the time of the invention to combine the teachings of Okawa et al. and Boesch et al. Using displacement measurements is an accurate and effective way to calculate tire pressure and so using a method of measuring travel distances would give accurate tire pressure results.

Allowable Subject Matter

Claims 20-26, and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record, either taken alone or in combination, does not teach the claimed limitation.

Claim 20 requires the vehicle has first, second and third axles, and the at least one wheel electronics package is provided for the wheels of the first, second and third axles, and the wheel sensors are provided on the wheels of the first and second axles.

Claim 21 requires the vehicle has first, second and third axles, and the at least one wheel electronics package is provided for the wheels of the second and third axles, and the wheel sensors are provided on the wheels of the first and second axles.

Claim 22 requires the vehicle has first, second and third axles, and the at least one wheel electronics package is provided for the wheels of the first and third axles, and the wheel sensors are provided on the wheels of the first and second axles.

Claim 23 requires the vehicle has first, second and third axles, and the at least one wheel electronics package is provided for the wheels of the third axle, and the wheel sensors are provided on the wheels of the first and second axles.

Claim 24 requires the vehicle has first, second and third axles, and the at least one wheel electronics package is provided for the wheels of the first axle, and the wheel sensors are provided on the wheels of the first, second and third axles.

Claim 25 requires the vehicle has first, second and third axles, and the at least one wheel electronics package is provided for the wheels of the first and second axles, and the wheel sensors are provided on the wheels of the first, second and third axles.

Claim 26 requires the vehicle has first, second and third axles, and the at least one wheel electronics package is provided for the wheels of the first and third axles, and the wheel sensors are provided on the wheels of the first, second and third axles.

Claim 30 requires the vehicle has second and third axles, dual sets of tires on each of the second and third axles, and the at least one wheel electronics package is provided for all of the dual sets of tires.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sugisawa (US 6,529,807) teaches an apparatus for alarming a decrease in internal pressure of tires based on rotational information obtained from the tires.

Randazzo et al. (US 5,929,756) teaches a method of detecting a partially deflated tire by detecting angular velocity signals.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Meagan S Walling whose telephone number is (703) 308-3084. The examiner can normally be reached on Monday through Friday 8:30 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (703) 308-3126. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

msw
May 2, 2003

John Barlow
Supervisory Patent Examiner
Technology Center 2800